REMARKS

The Office Action dated February 8, 2007 has been received and carefully noted. The above amendments to the claims, and the following remarks, are submitted as a full and complete response thereto.

Claims 1, 2, 4, 12, 13, 15 and 23-26 have been amended to more particularly point out and distinctly claim the subject matter of the invention. No new matter has been added. Claims 5-11 and 16-22 are allowable. Claims 1-4, 12-15 and 23-26 are submitted for consideration.

Claims 1-4, 12-15 and 24-26 were rejected under 35 U.S.C. 103(a) as being unpatentable over IEEE document to Feng (hereinafter Feng) in view of U. S. Patent No. 6,515,963 to Bechtolsheim (hereinafter Bechtolsheim). According to the Office Action, Feng discloses all of the limitations of the claims except for determining any credits or debits for the packet stream including a plurality of data packets from a source, wherein a probability marking of the packet stream is improved which there is sufficiently accumulated credit while a first criterion is met. Thus, the Office Action combined Feng with Bechtolsheim to yield all of the elements of claims 1-4, 12-15 and 24-26. The rejection is traversed as being based on references that neither teach nor suggest the novel combination of features clearly recited in independent claims 1, 2, 4, 12, 13, 15 and 24-26 and the dependent claims thereon.

Claim 1 recites a method including the steps of determining a sending rate estimate, s and determining any credits or debits for a packet stream including a plurality

of data packets from a customer domain. A probability marking of the packet stream is improved while there is a sufficiently accumulated credit and when a first criterion is met. The method further includes the step of probabilistically marking the packet stream to one of a plurality of priority levels based on the sending rate estimate, s. The packet marking is on a flow-aggregate or aggregate basis for the packet stream including a plurality of data packets from the customer domain.

Claim 2, upon which claim 3 depends, recites a method including determining a sending rate estimate, s and determining any credits or debits for a packet stream including a plurality of data packets from a customer domain. A probability marking of the packet stream is improved while there is a sufficiently accumulated credit and when a first criterion is met. The method also includes probabilistically marking the packet stream to one of a plurality of priority levels based on the sending rate estimate, s. Marking includes of determining if the sending rate estimate is less than a first rate threshold and in response to a determination that the sending rate estimate is less than the first rate threshold, setting a probability of marking at least one data packet with a first selected priority level is one of a plurality of priority levels. The packet marking is on a flow-aggregate or aggregate basis for the packet stream including a plurality of data packets from a customer domain.

Claim 4 recites a method including determining a sending rate estimate, s, and determining any credits or debits for a packet stream including a plurality of data packets from a source. A probability marking of the packet stream is improved while there is a

sufficiently accumulated credit and when a first criterion is met. The method also includes probabilistically marking the packet stream to one of a plurality of priority levels based on the sending rate estimate, s. Marking includes determining if the sending rate estimate is between a first rate threshold and a second rate threshold and in response to a determination that the sending rate estimate is between a first rate threshold and a second rate threshold. A probability of marking a data packet is set with a subordinate priority level based on s. The packet marking is on a flow-aggregate or aggregate basis for the packet stream including a plurality of data packets from a customer domain.

Claim 12 recites an apparatus including a first determining unit configured to determine a sending rate estimate, s, and a second determining unit configured to determine any credits or debits for a packet stream including a plurality of data packets from a source. A probability marking of the packet stream is improved while there is a sufficiently accumulated credit and when a first criterion is met. The apparatus also includes a marking unit configured to probabilistically mark the packet stream to one of a plurality of priority levels based on the sending rate estimate, s. The packet marking is on a flow-aggregate or aggregate basis for the packet stream including a plurality of data packets from a customer domain.

Claim 13, upon which claim 14 depends recites an apparatus including a first determining unit configured to determine a sending rate estimate, s, and a second determining unit configured to determine any credits or debits for the packet stream. A probability marking of the packet stream is improved while there is a sufficiently

accumulated credit and when a first criterion is met. The apparatus also includes a marking unit configured to probabilistically mark the packet stream to one of a plurality of priority levels based on the sending rate estimate, s. The packet marking is on a flow-aggregate or aggregate basis for the packet stream including a plurality of data packets from a customer domain. The marking unit includes a third determining unit configured to determine if the sending rate estimate is less than a first rate threshold. A setting unit configured to set a probability of marking at least one data packet with a first selected priority level to a first value. The setting unit is responsive to a determination that the sending rate estimate is less than the first rate threshold. The first selected priority level is one of a plurality of priority levels.

Claim 15 recites an apparatus including a first determining unit configured to determine a sending rate estimate, s, and a second determining unit configured to determine any credits or debits for the packet stream. A probability marking of the packet stream is improved while there is a sufficiently accumulated credit and when a first criterion is met. The apparatus also includes a marking unit configured to probabilistically mark-the packet stream to one of a plurality of priority levels based on the sending rate estimate, s. The packet marking is on a flow-aggregate or aggregate basis for the packet stream including a plurality of data packets from a customer domain. The marking unit includes a third determining unit configured to determine if the sending rate estimate is between a first rate threshold and a second rate threshold. A setting unit is configured to set a probability of marking a data packet with a subordinate priority

level based on s. The setting unit is responsive to a determination that the sending rate estimate is between a first rate threshold and a second rate threshold.

Claims 24 recites a computer program embodied within a computer readable medium, when executed the computer program includes means for marking a packet stream including a plurality of data packets from a source by performing determining a sending rate estimate, s, and determining any credits or debits for the packet stream. A probability marking of the packet stream is improved while there is a sufficiently accumulated credit and when a first criterion is met. Probabilistically marking of the packet stream to one of a plurality of priority levels is based on the sending rate estimate, s. The packet marking is on a flow-aggregate or aggregate basis for the packet stream including a plurality of data packets from a customer domain.

Claim 25 recites a system for marking a packet stream including a plurality of data packets from a source, including a metering tool for determining a sending rate estimate, s and a determining means for determining any credits or debits for the packet stream. A probability marking of the packet stream is improved while there is a sufficiently accumulated credit and when a first criterion is met. A router for probabilistically marking the packet stream to one of a plurality of priority levels based on the sending rate estimate, s. The packet marking is on a flow-aggregate or aggregate basis for the packet stream including a plurality of data packets from a customer domain.

Claim 26 recites an apparatus for marking a packet stream including a plurality of data packets from a source including a metering tool for determining a sending rate

estimate, s and a determining component for determining any credits or debits for the packet stream. A probability marking of the packet stream is improved while there is a sufficiently accumulated credit and when a first criterion is met. The apparatus includes a marking component for probabilistically marking the packet stream to one of a plurality of priority levels based on the sending rate estimate, s. The packet marking is on a flow-aggregate or aggregate basis for the packet stream including a plurality of data packets from a customer domain.

As will be discussed below, Feng and Bechtolsheim fail to disclose or suggest the elements of any of the presently pending claims.

Feng teaches a differentiated services architecture where packets are classified and marked with appropriate type of service (ToS) and routers at the network core support priority handling of packets based on their ToS value. The user specifies a desired minimum service rate for a connection or connection group and communicates that to a control engine which monitors and sustains the requested level of service by setting the ToS bit in the packet headers appropriately. See at least the Introduction Section of Feng. The engine snoops a connection passing through it and measures its observed throughput. If the observed throughput is lower than the requested target, the engine marks packets belonging to the connection. The fraction of marked packets varies from zero to one depending on the measured and target throughputs. Selective marking essentially upgrades a fraction of the packets belonging to the connection to a higher level. The engine continually adjusts the fraction of packets in order to sustain a bandwidth close the

requested target rate, while keeping the number of marked packets as low as possible. Page 687, lines 6-23.

Bechtolsheim teaches that a dynamic buffer limit is determined by look up in a pre-existing table or by live computation, indexed by parameter representing the dynamic state of an internetworking device. Col. 4, lines 55-64. The dynamic buffer limit table is computed from the router/switch state parameters. Col. 8, lines 17-20. Once the dynamic buffer limit appropriate to a received packet is determined, the packet may be tagged for further processing or enqueued. In one embodiment, a credit field is maintained in the flow table entry for each flow and is used to determine whether or not the packet is enqueued or tagged. A credit field is also maintained in the flow table for each indexed flow table entry and the credit value is incremented on enqueueing or decremented on marking or dropping. Once a flow exhausts its credits, or alternately, reaches a minimum threshold credit level, a separate NAF limit is enforced on that flow table entry, substantially less than and replacing the dynamic buffer limit. The credits give a flow several packets to respond to the initial packet drop before the flow is classified a NAF. Col. 9, line 60-Col. 10, line 35.

Applicant submits that the combination of Feng and Bechtolsheim simply does not teach or suggest all of the elements of claims 1, 2-4, 12-15 and 24-26. The Office Action acknowledged that Feng does not teach or suggest determining any credits or debits for the packet stream, wherein a probability marking of the packet stream is improved while there is a sufficiently accumulated credit and when a first criterion is met as recited in

claims 1, 2-4, 12-15 and 24-26. However, the Office Action combined the teachings of Feng and Bechtolsheim to teach improving the probability marking of the packet stream while there is a sufficiently accumulated credit and when a first criterion is met, as recited in claims 1, 2-4, 12-15 and 24-26.

Applicant submits that Bechtolsheim simply does not cure the deficiencies of Feng. In response to Applicant's arguments that Bechtolsheim does not teach improving the probability marking of the packet stream while there is a sufficiently accumulated credit and when a first criterion is met, as recited in claims 1, 2-4, 12-15 and 24-26, in the Response to Arguments section, the Office Action indicated that the flows disclosed in Bechtolsheim and Feng read on the claimed packet stream. Col. 1, lines 38-40 of Bechtolsheim discloses that each flow may include multiple packets of data. Bechtolsheim does not teach or suggest that the data packets in the flow are from a single source. In the present invention, as disclosed on page 4, parameters or rate thresholds are set to govern the rates of packets originating from a **customer domain**, that is, a single source. Page 4 of the present application discloses that one or more users may transmit packets from within IP addresses of the customer domains, wherein the sum of the packets of all users of the customer is known as the aggregate flow. The present application further discloses that a packet marker marks packets on a flow aggregate basis rather than on a per flow basis. Bechtolsheim does not teach or suggest that the packet stream includes a plurality of data packets from a source, as recited in the pending claims. Bechtolsheim does not teach or suggest that the packet marking is on a flow-

aggregate or aggregate basis for the packet stream including a plurality of data packets from a customer domain, as recited in the pending claims. As mentioned in the on page 6, lines 15-18 of the present application, the ISP router need not consider whether each flow belonging to a customer is individually traffic complaint; instead it may consider whether the **entire** customer traffic is compliant. Bectolscheim does not teach or suggest these features. Based on these arguments, Applicant assert that the rejection under 35 U.S.C. 103(a) should be withdrawn because neither Feng nor Bechtolsheim, whether taken singly or combined, teaches or suggests all of the elements of claims 1, 2, 4, 12, 13, 15 and 24-26 and claims 3 and 14 thereon.

Claim 23 was rejected under 35 U.S.C. 103(a) as being anticipated by U.S. Patent No. 6,463,068 to Lin (hereinafter Lin) in view of Bechtolsheim. According to the Office Action, Lin discloses all of the limitations of claim 23 except for determining any credits or debits for the packet stream including a plurality of data packets from a source, wherein a probability marking of the packet stream is improved which there is sufficiently accumulated credit while a first criterion is met. Thus, the Office Action combined Lin with Bechtolsheim to yield all of the elements of claim 23. The rejection is traversed as being based on references that neither teach nor suggest the novel combination of features clearly recited in independent claim 23.

Claim 23 recites a method for determining probability for marking a packet a priority level. The method includes determining a first probability by using a first algorithm and determining at least one second probability by using a second algorithm.

The first algorithm is different from the second algorithm. The method also includes weighting each probability so that each probability contributes to a net probability. The weighting includes determining any credits or debits for a packet stream. A probability marking of the packet stream is improved while there is a sufficiently accumulated credit and when a first criterion is met. The packet marking is on a flow-aggregate or aggregate basis for the packet stream including a plurality of data packets from a customer domain.

As will be discussed below, Lin fails to disclose or suggest the elements of claim 23.

Lin teaches a network with endstations and nodes that assign packets to classes of service based on information contained in the packets and/or on predetermined traffic management rules that are provided by the network manager and/or various service providers. The classes of service are essentially associated with maximum limits for transmission delays and probabilities of packet loss. Higher classes are associated with shorter maximum delays and lower probabilities of packet loss. Col. 3, lines 1-8. The network includes routers, each of which includes a classifier that associates a received packet with one of the classes of service. Col. 3, lines 33-35. The network also includes a policer that enforces network or service provider usage parameter controls by marking, discarding or passing the packet. If the policer marks an offending packet, it assigns the packet to a higher loss priority within the associated class of service. This increases the likelihood that the packet will be discarded if the network becomes congested. If the packet is already assigned the highest loss priority within the class of service, the policer

either passes or discards the packet, depending on the traffic management rules. Col. 4, lines 1-22. A WRED processor determines which of the packets that the policer has not discarded are to be retained in a buffer that holds the packets for every output port. The WRED processor uses a modified weighted random detection scheme, where each of the classes of service is associated with a maximum threshold and a minimum threshold. The WRED processor keeps track of the average number of available storage locations in the buffer. If the buffer is empty, all of the buffer storage locations are linked to a free queue. As packets are retained, buffer locations are removed from the free queue and linked to the appropriate class of service per output port queues. Each time a packet is received, the WRED processor determines a new weighted average free queue depth. The WRED processor compares the weighted average with the maximum threshold and the minimum threshold values associated with the appropriate one of the classes of service. If the weighted average exceeds the maximum threshold, the WRED processor retains the packet. If the weighted average falls below the minimum threshold value, the WRED process discards the packet. If the weighted average falls between the maximum threshold and the minimum threshold values, the WRED processor calculates a probability to discard. Col. 4, line 39 – Col 5, line 26.

Applicant respectfully submits that the combination of Lin and Bechtolsheim fails to teach or suggest each element of independent claim 23. As noted in the Office Action, Lin fails to teach determining any credits and debits for the packet stream as recited in claim 23. Bechtolsheim does not cure the deficiencies of Lin. As mentioned above,

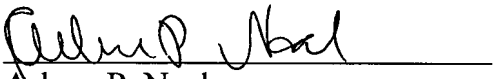
Bechtolsheim does not teach or suggest that the packet marking is on a flow-aggregate or aggregate basis for the packet stream including a plurality of data packets from a customer domain, as recited in claim 23. Therefore, Applicants respectfully submit that the combination of Lin and Bechtolsheim does not teach or suggest each of the elements recited in claim 23 and that the rejection under 103(a) should be withdrawn.

As noted previously, each of claims 1-4, 12-15 and 23-26 recites subject matter that is neither disclosed or suggested in the cited prior art references, when viewed either singly or in combination. It is therefore respectfully requested that all of claims 1-26 be allowed and this application passed to issue.

If for any reason the Examiner determines that the application is not now in condition for allowance, it is respectfully requested that the Examiner contact, by telephone, the applicants' undersigned attorney at the indicated telephone number to arrange for an interview to expedite the disposition of this application.

In the event this paper is not being timely filed, the applicant respectfully petitions for an appropriate extension of time. Any fees for such an extension together with any additional fees may be charged to Counsel's Deposit Account 50-2222.

Respectfully submitted,



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